

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF WISCONSIN
GREEN BAY DIVISION

)
UNITED STATES OF AMERICA and THE)
STATE OF WISCONSIN,)
Plaintiffs,) Case Action No.: 10-C-910
v.)
NCR CORPORATION, APPLETON)
PAPERS INC., CITY OF APPLETON,)
CBC COATING, INC., GEORGIA-)
PACIFIC CONSUMER PRODUCTS LP,)
KIMBERLY-CLARK CORPORATION,)
MENASHA CORPORATION, NEENAH-)
MENASHA SEWERAGE COMMISSION,)
NEWPAGE WISCONSIN SYSTEMS,)
INC., P.H. GLATFELTER CO., U.S)
PAPER MILLS CORP. and WTM I)
COMPANY,)
Defendants.)

)
MENASHA CORPORATION,)
Counter-Claimant,)
v.)
UNITED STATES OF AMERICA and THE)
STATE OF WISCONSIN,)
Counter-Defendants.)

I, Robert L. Annear Jr., declare as follows:

1. In 2010, Geosyntec Consultants (“Geosyntec”) was retained to perform analysis related to the polychlorinated biphenyl (“PCB”) contamination in the Lower Fox River and Green Bay Superfund Site in Wisconsin (“Lower Fox River Site”). Geosyntec was retained initially in connection with the *NCR Corp. v. George Whiting, et al.* litigation (Case No. 08-CV-00016-WCG, in the Eastern District of Wisconsin) (“Whiting Litigation”). Geosyntec’s retention has been extended to include the *U.S. v. NCR Corp., et al.* litigation (Case No. 10-910-WCG, in the Eastern District of Wisconsin) (“Enforcement Litigation”).

2. I was originally asked to conduct an evaluation of the fate and transport model used at the Lower Fox River, known as the Whole Lower Fox River Model (“wLFRM” or “Model”), and to determine if the United States and the State of Wisconsin (collectively, the “Governments”) had made available all of the necessary computer model files to assess the completeness of the way the Model was developed, recreate the Model developed by WDNR, and then to reconstruct the Model output provided by WDNR. My first Declaration was submitted in April 2012. Dkt. 392. I produced a Supplemental Declaration in July 2012, where I was asked to review documents and to respond to the arguments asserted by the Governments in opposition to Menasha’s Motion for Summary Judgment or in The Alternative to Supplement the Administrative Record (“Menasha’s Motion”). Dkt. 449. For this second Supplemental Declaration, I was asked to review some of the documents and computer files produced by the Governments to the Certain Defendants after Menasha’s Motion was filed and to conduct a review of WDNR emails, WDNR internal memorandums and the depositions of Dr. Xiaochun Zhang on August 24, 2012 and Dr. Mark Velleux on August 29, 2012 to determine if the newly

produced material contained substantive facts regarding the development and calibration of the wLFRM that were previously unavailable to the Certain Defendants.

3. I am a Senior Engineer in the environmental consulting firm of Geosyntec, located at 55 SW Yamhill St., Suite 200, Portland, Oregon. I have been with Geosyntec since January 2011. Geosyntec performs engineering services for environmental remediation and water resources projects throughout the United States, as well as locations in Asia and Europe. My qualifications and a copy of my most recent resume were provided as Attachments A and B, respectively, to my April 30, 2012 Declaration previously filed with the Court at Dkt. 392.

4. I have personal knowledge of the facts set forth herein, and if called upon as a witness I would testify competently to them.

STANDARD TO WHICH MY OPINION IS GIVEN

5. My opinions are given to a reasonable degree of scientific certainty. In addition, my opinions are based on my knowledge, skill, experience, training and education, on my review of pertinent documents, statutes, regulations and my professional experience. My Supplemental Declaration details the conclusions of my investigation.

BASIS OF MY OPINION

6. The information I relied upon in forming my opinions is of a type reasonably relied upon by experts in my field in forming the opinions contained in my Supplemental Declaration. The information I reviewed in preparation of my Supplemental Declaration is contained in Appendix 1.

7. Due to the massive amount of data provided in and since June 2012, the data sets described in Appendix 1 are still undergoing review that will take several months to complete, and therefore I reserve the right to supplement my Supplemental Declaration further.

SUMMARY OF MY SUPPLEMENTAL OPINION

8. As discussed in greater detail below, it is my opinion that information provided by the United States and the State of Wisconsin in discovery since June 2012 makes clear that the Model was not calibrated to the \pm 30% standard in Technical Memorandum 1.

INFORMATION PROVIDED BY THE UNITED STATES AND THE STATE OF WISCONSIN IN DISCOVERY SINCE JUNE 2012 DEMONSTRATES THAT THE MODEL WAS NOT CALIBRATED TO THE \pm 30% STANDARD CONTAINED IN TECHNICAL MEMORANDUM 1

Model Calibration Requirements

9. The calibration requirements for all of the models at the Site are contained in Technical Memorandum 1 (“Tech Memo 1” or “TM1”). Tech Memo 1 contains both quantitative and qualitative standards for all the models being used at the Site. A quantitative standard for model calibration in TM1 states:

To evaluate the existing models, the following model quality criteria are proposed: mean predicted concentrations for TSS and PCBs should be within \pm 30% of observed values for water and sediment and within \pm a factor of 3 (\pm 1 order of magnitude) for short-term simulations and \pm 50% for water and sediments and a factor of 5 for fish for long-term simulations. These criteria are

Tech Memo 1 at DOJEPAN060736. Thus, the Model had to meet the quantitative standard of \pm 30% of observed values for total suspended solids (“TSS”) and PCBs for water *and sediment*. Final Model Documentation Report, Appendix B-1 at DOJEPAN062275.

Recently Discovered Documents Demonstrate that the Model Was Not Calibrated to the Required Tech Memo 1 Quantitative Standard

10. A review of some of the evidence produced by the Governments since June 1, 2012 (Emails, Memorandums and Depositions) indicates that attempts to calibrate the Model

were plagued with problems, omissions, delays and criticisms from WDNR's contractor team.

Some of the more critical correspondence is discussed below.

11. In an email from Mark Velleux to Ferdi Hellweger (HQI) dated April 3, 2000 (E-WDR-292526), Dr. Velleux describes to Ms. Hellweger the status of the Model calibration and discusses sample results from only 1989 were used, notwithstanding that the full calibration period is from 1989 to 1995. Exhibit 21.¹ Dr. Velleux acknowledges the IPX Model is not calibrated at this point except the annual solids load "is reasonable." This indicates only a limited subset of the Model calibration period was calibrated for "annual solids loads" only between February 10 and April 3, 2000, which indicates the Model calibration is moving very slowly and hence there are many problems upfront with the calibration.

12. In an email from Mark Velleux to Edward Lynch and Gregory Hill on June 23, 2000 (E-WDNR-292698), Dr. Velleux advises Mr. Lynch and Mr. Hill that "the calibration is not good (it is poor)." Exhibit 25. The Model is predicting a sedimentation rate of 0.35 cm/year but the data infers a net burial rate of 1 to 2 cm/yr. He believes there is enough sediment loading to the Model on an annual basis but the Model is under-predicting the sedimentation rate, meaning the Model is over predicting the potential for PCB contaminated sediments to migrate in the Lower Fox River. Dr. Velleux then notes:

One key aspect is examining the temporal distribution of the loads (which are uncertain). ***The other (and more troubling) aspect of this is that there is a chance that the net burial rate is so uncertain and it is not an effective model evaluation metric.*** Since net burial is a key point in assessing model performance, this merits some thought. We can't "swag" the net burial issue. Without more detailed quantification, I will not be able to address this.

¹ All references to Exhibits in my Supplemental Declaration are to the Exhibits attached to the Declaration of Philip C. Hunsucker.

(Emphasis added.)

13. In a partial email thread from Mark Velleux to Edward Lynch and Gregory Hill, dated June 24 - 26, 2000 (E-WDNR-292695), Dr. Velleux notes on June 24, 2000 that he is calibrating the Model for solids from 1989 to 1995 but that the net burial rate will be 0.35 cm/yr. (average is 0.7 cm/yr.). Exhibit 26. The data though indicates a net burial rate of 1.4 cm/yr. that is 4 times what the Model is showing. Dr. Velleux stated: "So, the bottom line here is that I am proceeding *as if*: 1) the present model set-up is an appropriate calibration; and 2) we will be able to quantify that net burial rates in the river have decreased over time. " (Emphasis added.)

14. Based on a review of the Model calibration in Appendix B1 of the Final Model Documentation Report, the net burial for river reaches 1 to 4 were +0.43 cm/yr., -0.03 cm/yr., +0.25 cm/yr., and 0.12 cm/yr. (Table 4-7, Page 84), indicating the Model's net burial rate was still being under-predicted compared to data which ranged as high at 1.4 cm/yr. (Table 4.7). As a result, it is clear the Model is not well calibrated to the net burial rate that is an essential component of the Model.

15. Dr. Velleux emailed Edward Lynch on June 29, 2000 regarding "Pull the plug?" Exhibit 27, bates labeled E-WDNR-292694. In it, Dr. Velleux stated:

As much as I wish it were otherwise, I think it may be time to consider rescheduling the meeting with EPA. Model performance is getting much better with each iteration but still has not reached the minimum acceptable threshold. I am working, and will continue to work, to complete this effort. I recognize that this effort is impeding completion of the RIFS. ***Until model performance reaches an acceptable level, I do not recommend presentation of results.***

I understand that rescheduling this meeting would be very difficult for many reasons. I nonetheless ask you to try to reschedule. Please also recognize that I have worked many extra hours on this effort. ***If the solids model calibration does not meet minimum quality by the end of the day on 6/29, I will not be able to complete a PCB calibration (and a presentation) in time for 7/6. Again, I do not recommend presentation of results until we meet minimum performance***

levels. Since we have not yet met this goal, I ask that you at least reconsider rescheduling the meeting.

(Emphasis added).

16. On July 31, 2000, Edward Lynch emailed Mark Velleux and Gregory Hill regarding “Design of model forecasts.” Exhibit 28, bates labeled E-WDNR-293513. In it, Mr. Lynch discussed the “methodology outlined for conducting the forecasts” as agreed to by WDNR and USEPA. Mr. Lynch tells Dr. Velleux:

As far as justifying the number of “millions” of yards to remediate, we are looking at action levels based on concentrations in the sediment. We will then use the forecasts results (along with other non-modeling information such as the TTA, Information on location of the PCB mass, remaining risk, cost to remediate, etc.) to determine where and how much sediment will be remediated by dredging or other means such as no action or natural processes. So one of the things we would need from the model forecasts would be the effect of removing the specified amount of sediment and PCB mass from the system to meet the action level.

(Emphasis added).

17. On August 30, 2000, Edward Lynch emailed Dr. Velleux and Gregory Hill regarding “Pre meeting to prepare for meeting with EPA.” Mr. Lynch’s August 30, 2000 email, bates labeled beginning E-WDNR-274819, is Exhibit 29. In it, Mr. Lynch asserts to Dr. Velleux:

Mark; To provide context and let our contractor know how we got to the point we are at with regards to the River Model calibration, *I would like you to provide Tim with an email that provides the various calibration figures*, tables, etc. that got us through calibration and what is necessary prior to us being able to run any forecasts using the model . . .

Mark and Greg; *As I have said before (and I will say again), I cannot be the decision-maker or judge of the adequacy of the Fox River model. I am relying on the WT program, specifically the Water Quality Modeling Section, to make that determination. I am also relying on WT to prepare the necessary input files and documentation for this model as well as other model documentation for which DNR is responsible.*

Greg and Mark; I would really like your input concerning the model documentation. TR is proceeding with the approach outlined previously and is we are to make any changes to it, we need to decide now.

(Emphasis added).

18. On August 31, 2000, Dr. Velleux responded to Gregory Hill and copied Edward Lynch regarding “Pre meeting to prepare for meeting with EPA.” Exhibit 29. In it, Dr. Velleux responds regarding bullet 3 in Mr. Lynch’s email (at E-WDNR-274819):

This bullet gives me the impression that Ed now has questions regarding the nature of the results obtained from the river model. *It looks Ed proposes that some degree of decision-making regarding the fitness of the river model fall to you and/or me to certify the “fitness” of the model for use in the RI/FS. I do not understand this request.* I have spent 10 months researching and developing a whole river model for the RI/FS. I presented these results to you, Ed, and Bruce in informal meetings in July. To the extent that valid model-data comparisons can be drawn, I demonstrated model performance. *In particular, I noted that model meets performance goals measured by the water column metrics identified in Tech Memo 1. I also noted that the limitation to this assessment was that sediment metrics could not be applied because of the difficulty in assembling data to make a valid examination of time trends in sediment PCB levels. I then offered the opinion that model development looked complete because further development would require making assumptions regarding erosion potential and sediment PCB time trends. It was my understanding that you, Ed, and Bruce concurred with this opinion. With that concurrence (i.e., the decision that model development was complete), I then delivered loads to HQI and exposures to TR and QEA.*

Although not directly stated, I believe Ed is referring to uncertainties regarding model performance raised in QEA’s recent email. Please be aware that, without question, QEA has advanced a spurious data interpretation to make a model-data comparison. However, that does not mean the model is without its limitation. As you are well aware, the process assess the performance of a complex model is by nature also complex. In the model development effort, I have examined the data used to assign model parameter values as well the data used to assess performance. *The data permit assessment of water column metrics. For those water column metrics, model performance meets the goals identified in Tech Memo 1. The data do not permit development of unequivocal sediment metrics.* It was therefore difficult to assess model performance with sediment metrics. In my discussions with you and Ed I have described the limitations associated with that aspect of model performance. Given those limitations, I offered the opinion that model development had reached a reasonable conclusion.

(Emphasis added).

19. Deposition testimony from Mark Velleux, discussed below, makes it clear that in the end Mark Velleux was left to decide if the Model was calibrated, even though everyone at WDNR knew that it did not meet the agreed upon metrics of Tech Memo 1. Mark Velleux eventually claimed that the Model was calibrated. The results of the Model were presented in the Final Model Documentation Report, Appendix B. These results were relied upon for the Proposed Remedial Action Plan for the Site, eventually published in October 2011 (WDNR043002560).

Recently Discovered Documents Demonstrate that WDNR Employees and Its Contractors Reviewing the Model Results Told Decision Makers that the Model Was Not Calibrated

20. A memorandum from Tim Thompson of ThermoRetec (Retec) to Edward Lynch and Gregory Hill on October 25, 2000 (E-WDNR-285520-23) discusses his concerns about the Model sediment calibration. Exhibit 30. Mr. Thompson states he represents the WDNR's entire contractor team of Retec, SSPA, HydroQual (HQI) and QEA, and that the group is unanimous that the Model should be calibrated not just to the PCB concentration in the water column but also to PCB concentrations in the sediments to effectively evaluate sediment remedial alternatives and to have more confidence in the Model's ability to predict sediment concentrations. Based on a review of the wLFRM report from June 2001 (Appendix B1 of the Final Model Documentation Report), WDNR did not include these requested evaluations and did not calibrate the Model to PCB concentrations in the sediments as WDNR's contractor team recommended.

21. On May 18, 2001, Mark Velleux was working on the Final Model Documentation Report and emailed Gregory Hill regarding "Draft of Appendix B," the discussion of the

wLFRM within that report. A copy of Dr. Velleux's email, bates labeled E-WDNR-311045, is Exhibit 32. In it, Dr. Velleux states:

A draft of Appendix B of the wLFRM report, describing apparent temporal and spatial trends in Lower Fox River sediment PCB concentrations, is complete. The material in this appendix is critical to the overall assessment of model performance. The trends described in the appendix (see Table B-2) are the "standard" against which model performance is judged. I anticipate that this material will be even more heavily scrutinized than other aspects of model development and evaluation.

The results presented depend on the interpretation of statistical tests and regression analyses. Unfortunately, statistics is not an area where I have much expertise. Therefore, additional review of these results is needed. Before being accepted as part of the wLFRM report, I believe it is critical to have someone with expertise interpreting statistical results review this work. I therefore request that you take action to arrange for the technical review of this appendix by Department statisticians. Additional editorial review would also be beneficial.

WDNR did have a person with expertise in statistics review the document. That person was Paul Rassmussen.

22. On June 5, 2001, Paul Rasmussen of WDNR wrote a memorandum to Gregory Hill and Mark Velleux of WDNR. A copy of Mr. Rasmussen's memorandum, bates labeled beginning E-WDNR-311539, is Exhibit 34. In it, he summarizes his comments on Appendix B, specifically the "Assessment of spatial and temporal trends in Lower Fox River PCB concentrations:"

Summary:

Appendix B reports results of analyses to estimate temporal and spatial trends in sediment PCB concentrations from the lower Fox River. Because the data were not collected as part of a study designed to estimate these trends, the effects of time and location and probably confounded. Variability in analytical methods further complicates the estimation of trends. Statistical analyses reported in Appendix B suggest that sample location explains more of the variation in PCB concentration than does sample collection year. It is difficult to assess how spatial effects may bias estimates of temporal trend in this data set. Any estimates of trend based on this data

set should be used cautiously. If estimation of temporal trends is needed, I recommend designing a study specifically for that purpose.

Data:

A major difficulty with estimation of trends in Fox River sediment PCB concentrations is that the data were not collected as part of a study designed for this purpose. In some years (e.g., 1989) samples were collected from throughout the river, in other years samples were collected primarily from either more contaminated or less contaminated sites. In this situation it may be difficult or impossible to separately estimate the effects of both time and location. Another factor known to affect observed PCB concentrations is analytical methods as described in Appendix B. Because analytical methods were not standardized during the period of data collection, it is difficult to carry out an analysis that accounts for their effects on the PCB concentrations.

Analyses and Results:

...
Because of the sample collection procedures, it is difficult to model these sources of variability or to assess how much effect they may have on estimates of temporal trends. In this situation, I would be hesitant to base management decisions on estimates of temporal trends determined from data collected without a design developed specifically for the estimation of such trends.

...

Future monitoring design:

I recommend designing a monitoring program that can be used to estimate temporal trends in PCB concentration in the future. There is a literature on environmental surveys for this purpose (see the December 1999 issue of the Journal of Agricultural, Biological, and Environmental Statistics). Typically, these designs involve initial selection (usually with some random component) of a set of sites that will be sampled repeatedly, although all sites are not necessarily sampled at each time) (e.g., one-fourth of the sites might be sampled each year). The design should include specifics of sample location and collection as well as analytical procedures.

(Emphasis added). In other words, the samples collected in the field are highly uncertain and should not be used for time or spatial trend analysis. So not only was the Model not calibrated to the PCB concentrations in the sediment, it is doubtful this data could even be used to calibrate the Model. As a result the Model cannot be relied on to predict sediment concentrations in the

forecast simulations because the data necessary to calibrate it was insufficient. Nevertheless, the WDNR continued to rely on the Model.

23. After the Proposed Remedial Action Plan was published in October 2001, comments were received from the public. Mark Velleux had left the WDNR to enroll in a Ph.D. program at Colorado State University, so the WDNR asked Dr. Xiaochun Zhang to prepare responses to comments on the Model in 2002. Dr. Zhang began a search for components of the Model between approximately January and June 2002.

24. On June 6, 2002, Dr. Zhang emailed Edward Lynch regarding “wLFRM” to discuss Wisconsin Tissue’s comments on the PCB data in the river showing a strong downward trend in the PCB concentrations that is not shown in the wLFRM results.” A copy of Dr. Zhang’s email, bates labeled E-WDNR-327909, is Exhibit 56. In it, Dr. Zhang notes to Mr. Lynch that:

I felt the surficial sediment PCB trend analyses presented by FRG and our consultant have not taken account of the data incomparability issue. The locations where samples were collected varied greatly in space among the data sets; therefore, it is incorrect to analyze the temporal trend based on that although some sophisticated methods were used. To give you an idea of how different the sample locations were I attached a plot with sample locations for 1989 and 2000 & 2001 data sets. The 1989 data set showed high PCB concentrations in sediments located in the area highlighted with a pink circle; however, only two cores were collected in 2000 & 2001.

(Emphasis added.) This is the same problem pointed out by Tim Thompson (Retec) to Edward Lynch and Gregory Hill on October 25, 2000. This email demonstrates that the sediment concentration data was not sufficient to calibrate the Model.

25. In a response from Mr. Lynch the same day, he states that WDNR cannot redo a sediment analysis every time new sediment core data is collected, and directs that no new

analysis be conducted beyond the work done by Dr. Velleux in the appendix to the Appendix B1 model report. Exhibit 56.

26. In an email from Dr. Zhang to Gregory Hill on June 6, 2002 (E-WDNR2-482811) Dr. Zhang indicates after reviewing the IPX input files and talking to Mark Velleux that she confirmed that the process of pore water diffusion of PCBs from the surficial sediments to the water column was not included in the calibrated Model or 100-year forecast simulations. Dr. Zhang notes this was a “mistake,” and that Dr. Velleux forgot to put it in the model. Exhibit 57. Dr. Zhang further acknowledges that the Fox River Group (FRG) considered this a significant pathway of PCBs from the sediments to the water column. Given the time period of this email (June 2002), this was most likely a comment submitted by the FRG that Dr. Zhang was responding to in preparation for the Final Model Documentation Report in December 2002. From a review of the Responsiveness Summary to the Draft Model Documentation Report (Section 6.2.6, Water Column/Pore Water, Master Comment 6.13), this omission from the Model does not appear to have been corrected, as the response to the comment was that “*the impact of this oversight is expected to be very small.*” The response also indicates this issue is discussed in the White Paper No. 16, but upon reviewing White Paper No. 16, the response to this comment on pages 5-10 and 5-11 in White Paper No. 16 is almost identical to the Responsiveness Summary, providing no additional information on how the impact was assessed and determined to be “very small.” Both documents indicate pore water transfers between sediment layers were included in the model but that an oversight resulted in excluding pore water transfers between the surficial sediments and the water column. This omission is not insignificant, because the concentration of PCBs in the sediments would be higher than in the water column (since there are no continuing point sources of PCBs entering the river aside from residual stormwater

loading); the PCB concentrations would be expected to be higher in the pore water compared to the water column. As a result of the omission there is less PCBs transferring from the sediments to the water column and downstream to Green Bay, resulting in higher sediment concentrations than would be expected. As noted in the IPX User's Manual (Velleux, 2000): "***Diffusive exchanges between pore waters and with the overlying water column can significantly influence sediment pollutant concentrations... Depending on the dissolved chemical concentration gradient, pore water diffusion may be a source or sink of pollutants to overlying waters.***" (Emphasis added). Given that the PCB concentration gradient would be from sediment (high) to the water column (low) then the pore water diffusion would be a source of PCBs to the water column thus reducing the concentration in the sediments. This model omission may be one of the reasons why the calibrated Model and the no-action forecast model show a substantial increase in PCB concentrations in the surficial sediments which was noted by LTI (LTI, 2002).

27. On June 26, 2002, Dr. Zhang emailed Edward Lynch and copied Gregory Hill, and included an attachment titled "R-naturaldecrease-ms.doc." A copy of Dr. Zhang's June 26, 2002 email and attachment, bates labeled beginning E-WDNR-197106, is Exhibit 58. In the attachment concerning "Responses to comments related to model prediction of natural recovery," Dr. Zhang states:

However, the overall model results from wFLRM [sic] did show a declining trend in water and sediment over a long term under no action scenario. The declining rate is not as significant as FRG stated which was based on not carefully considering the horizontal variation of the data available. The spatial heterogeneity of the system may confound assessments of temporal variability.

Samples collected over the years, in most of the cases, are incomparable in horizontal locations, particularly for the LLBdM sediments. Since the objectives of each sampling project was different the sampling intensity, segmentation scheme, and sample locations varied greatly from investigations. It is well known the distribution of sediment contamination in river sediments varies greatly in

space as described in Appendix B of FS report [WDNR, 2002]. ***These data could hardly be used to conclude a temporal trend with certain accuracy.*** To illustrate how different the distribution of sediment core locations samples collected in 1989-1990 were compared to 2000-2001 samples for LLBdm and to 1995 samples from downstream of DePere Dam. The results are as follows:

...

It is believed that in order to produce credible trend analysis, one has to compare the data collected in different time for similar locations. Otherwise, high uncertainties will result. Comparison of the PCB profiles located at the similar places showed no significant declining trend.

Issue 3: based on the discussion above, data collected before 2000 may not be sufficient enough to draw a conclusion whether the surficial sediment PCB concentrations were declining. ***The predicted increase of surficial sediment PCB concentrations could be a real trend downstream of DePere Dam. But the uncertainties could be high.*** The latest data collected in 2000-2001 by FRG downstream of DePere Dam may be compared to 1995 data . . .

Exhibit 58 at E-WDNR-197107-08 (emphasis added).

28. On July 31, 2002, Dr. Zhang emailed Gregory Hill regarding “summary of the modeling efforts for the Fox River.” A copy of Dr. Zhang’s email, bates labeled E-WDNR2-482781, is Exhibit 59. In it, Dr. Zhang states: “the attached file is the draft I got. ***We need to discuss this because I do have some concerns of the model.***” Exhibit 59 (emphasis added).

29. At this point WDNR sought to hire Dr. Velleux on a contract basis to help with the response to comments.

30. On August 29, 2002, Mark Velleux emailed Edward Lynch regarding “More on wLFRM Comments” in which Dr. Velleux responds to comments from Retec on the Model. A copy of the email chain, bates labeled beginning E-WDNR-197054, is Exhibit 60. In it, Dr. Velleux states:

For what its worth, I've seen the proposed responses XZ [Dr. Zhang] crafted as well as the proposed “white paper”. It is also my understanding that Mr. Hill is representing: 1) that his staff do not have the technical skill to address these

issues; and 2) that the wLFRM (“the product of Velleux”) “is little value in its present form” in the opinion of XZ. Given what I’ve seen, I can understand your concern that the proposed responses do not really address the comments in a meaningful way.

You need to define a work product. Given the mantra of “better, faster, cheaper: pick any two”, you have to decide how you want to optimize this. If you can live with the responses XZ/Hill have proposed, you are done. If you want a better product, define a scope of work and lets work out a contract and schedule.

(Emphasis added).

Recently Obtained Deposition Testimony

31. During his deposition on August 29, 2012, Dr. Velleux testified he was the person charged with deciding whether to go with the Tech Memo 1 standard:

Q: I understand. And I'm going to have some more questions about the language, but as to the decision that you were bandying about here, what was the decision that was ultimately made? Go with the Tech Memo 1 standard or not?

A: As - as I recall the situation, that was left to me to decide if the model was good enough for use and to certify it. And I went with the technical - the Tech Memo 1 standard. And when - I passed as many of the metrics as I could perform. I say "I," but it's referring to the wLFRM river model. Then that was good enough. And information could then subsequently flow onto the other models for them to finish their calibration.

Q: Okay. So the good enough was left to you, basically.

A: In this particular case, following the guidance, if you will, directives -

Q: Okay.

A: -- of Tech Memo 1.

Velleux Deposition, Exhibit 5 at 194:9-195:3.

32. Dr. Velleux also testified that:

Q: Okay. So what have you figured out in reference to my question?

A: Your question, to the extent that I recall it, was what were the quantitative value of the metrics for the sediment in the model data comparisons there. And I'm looking at some of the text. In this particular case, this is the Bates No. - 2303, and it says in this case, model results are 83 percent less than observations on average, and this was with bed elevations and their changes. In this particular case, this is the Bates No. -2303, and it says in this case, model results are 83 percent less than observations on average, and this was with bed elevations and their changes. In this particular case, the model was suggesting only gradual changes in bed elevation, whereas the measurement suggests wide and very spatially different average -- changes in bed elevation over time. Going to the next page, which is the last four digits are -2304, there is a Table 4-7, which is a comparison of net burial rates. I don't see that I summarize that in terms of a percent relative difference, but as shown there in terms of net burial rates, the ranges of values inferred from measurements ran from .2 to 1.4 centimeters per year using one set of data, .35 centimeters per year from another set of data, and the model average was .22 centimeters per year. While not – maybe not exactly 30 percent differences, the one – the model values in the range of the one data set, and certainly within 50 percent of the other.

Q: For sediments.

A: For sediments.

Q: But not 30.

A: But not 30. The best that could be achieved, that's the intent of it.

Velleux Deposition, Exhibit 5 at 203:11-204:20. In other words, Dr. Velleux's deposition revealed the wLFRM did not meet the Tech Memo $1 \pm 30\%$ calibration performance metric for the PCB concentration in the sediments, but WDNR elected to proceed with the use of the Model in the remedial decision process anyway.

33. Dr. Zhang was designated as the person most knowledgeable to testify on behalf of the State of Wisconsin regarding the Model. Zhang Deposition at 6:16-22. In her August 24, 2012 deposition, Dr. Zhang testified that the Model did not meet the Tech Memo $1 \pm 30\%$ calibration performance metric for the PCB concentration in the sediments. Zhang Deposition, Exhibit 3 at 101:20-102:16. Dr. Zhang pointed to the lack of data for PCBs in sediment in the river. According to Dr. Zhang:

Q: In terms of the confidence level of the model or the -- regarding calibration, isn't it so that the PCB concentration in sediments didn't meet the Tech Memo 1 standard?

A: This is a very interesting question. In my knowledge, it would be very hard to do any calibration regarding the sediment PCB concentrations for any modeling work.

Q: Why is that?

A: Why is that? Because every study, when investigators collect samples, the samples were collected from probably different places using different device for different objectives. The uncertainties associated with that are high. The sediment is very much not a homogeneous media, so it will be really, really hard to conduct a calibration regarding the sediment PCB concentrations for modeling effort.

Q: And the more limited the data you have about PCB in sediments, the harder it will be, right?

A: Yes. And it is very costly to collect sediment data for PCB analysis.

Zhang Deposition, Exhibit 3 at 101:20-102:16. The PCB concentration data collected in the sediments prior to running the Model was extremely limited – physiochemical samples were taken from over 500 sediment core locations in the entire 39 miles of the River between 1989 and 1997 (Technical memo 2e). Given the spatial and temporal variability of the data, in my opinion, this is an insufficient amount of data to calibrate the Model to the Tech Memo 1 standard for PCB concentrations in sediments of \pm 30%.

SUMMARY AND CONCLUSIONS

34. Emails, internal memorandums, and depositions made available after June 1, 2012 demonstrate that the Model was not calibrated to the Tech Memo 1 quantitative standard for PCBs in sediment. The WDNR contractor team all agreed in a memorandum to WDNR that the Model should be calibrated to sediment PCB concentrations as required by Tech Memo 1 and it was not done.

I declare under the penalty of perjury under the laws of the U.S. Government and the State that the foregoing is true and correct and that this declaration was executed on September 28, 2012, at Portland, Oregon.

By:



Robert L Annear Jr., Ph.D., P.E.

APPENDIX 1

In the preparation of my Supplemental Declaration, I reviewed the following information:

- The declaration of Dr. Xiaochun Zhang (“Zhang Decl.”) (Dkt 437);
- The United States’ Statement of Undisputed Facts (Dkt 440);
- The Governments’ brief in opposition to Menasha’s Motion (Dkt 441);
- The additional data provided in a set of five DVDs received on June 8, 2012, dated May 31, 2012 (Fox River: United States v. NCR Corp., et al., Lower Fox River Model Documents (No Bates)) or June 1, 2012 (Lower Fox River Model Documents, Bates: WDNR147003015 – 147057826; native, image or data files) which included 87,356 files consisting of 25 GB of data, the review of which could only be completed after July 9, 2012 due to the volume of data produced;
- The additional data on the DVD dated June 15, 2012 which was received on June 19, 2012 and contains 4,140 files and 425 MB of data, the review of which could only be completed after July 9, 2012 due to the volume of data produced;
- The deposition transcript from Dr. Zhang on August 24, 2012;
- The deposition transcript from Dr. Velleux on August 29, 2012;
- Two DVDs titled “United States, et al. v. NCR Corp., et al., Lynch/DNR Response” and “United States, et al. v. NCR Corp., et al., Whole Lower Fox River Model Projection Input & Results” dated on June 25, 2012 and received on June 26, 2012, the review of which could only be completed after July 9, 2012 due to the volume of data produced;

- A CD (dated June 26, 2012), a thumb drive, transmittal letter from Francis A. Citera at Greenberg Traurig to Geosyntec (dated June 29, 2012) and a letter from Mark Velleux to Francis A. Citera (dated June 26, 2012), all received on July 2, 2012, the review of which could only be completed after July 9, 2012 due to the volume of data produced; and,
- The various emails and other correspondence that I have been advised were produced by the Governments after June 1, 2012.